

What is claimed is:

1. A method of displaying a fluorescent-light image comprising

irradiating a target area with an illuminating light and  
5 a excitation light that has been emitted from a excitation light emitting means and guided to said target area,

obtaining, by use of a single image obtaining means provided with separate image obtaining portions for obtaining a  
fluorescent-light image and a standard-image, respectively, a  
10 fluorescent-light image formed of the fluorescent-light emitted from the target area upon the irradiation thereof by the excitation light and a standard-image formed of the reflected-light reflected from the target area upon the irradiation thereof by the illuminating light, and

15 displaying a fluorescent-light image based on the obtained fluorescent-light image and a standard-image based on the obtained standard-image, further comprising

detecting that an operational irregularity has occurred in the excitation light emitting means, and in response to a detection  
20 signal thereof,

emitting the illuminating-light,

switching the image obtaining means to a standard-image obtaining mode,

obtaining the standard-image, and

25 displaying the standard-image.

2. A method of displaying a fluorescent-light image

comprising

irradiating a target area with an illuminating light and  
a excitation light emitted from a excitation light emitting means  
and a reference-light emitted from a reference-light emitting means  
5 and which have been guided to said target area,

obtaining, by use of a single image obtaining means provided  
with separate image obtaining portions for obtaining a  
fluorescent-light image, a standard-image, and a reflected-light  
image, respectively, a fluorescent-light image formed of the  
10 fluorescent-light emitted from the target area upon the irradiation  
thereof by the excitation light, a standard-image formed of the  
reflected-light reflected from the target area upon the irradiation  
thereof by the illuminating light, and a reflected-light image  
formed of the reflected-light reflected from the target area upon  
15 the irradiation thereof by the reference-light, and

displaying a fluorescent-light image based on the obtained  
fluorescent-light image and the obtained reflected-light image  
and a standard-image based on the obtained standard-image, further  
comprising

20 detecting that an operational irregularity has occurred in  
at least one of the excitation light and reference-light emitting  
means, and in response to a detection signal thereof,

emitting the illuminating-light,

switching the image obtaining means to a standard-image

25 obtaining mode,

obtaining the standard-image, and

displaying the standard-image.

3. A method of displaying a fluorescent-light image comprising

irradiating a target area with an illuminating light and  
5 a excitation light that has been emitted from a excitation light emitting means and guided to said target area,

obtaining, by use of a single image obtaining means provided with separate image obtaining portions for obtaining a  
fluorescent-light image and a standard-image, respectively, a  
10 fluorescent-light image formed of the fluorescent-light emitted from the target area upon the irradiation thereof by the excitation light and a standard-image formed of the reflected-light reflected from the target area upon the irradiation thereof by the  
illuminating light, and

15 displaying a fluorescent-light image based on the obtained fluorescent-light image and a standard-image based on the obtained standard-image, further comprising

detecting that an operational irregularity has occurred in any one of the image obtaining portions, and in response to a  
20 detection signal thereof,

emitting the illuminating-light,

obtaining, by use of the image obtaining portion that is not operating irregularly, a standard-image formed of the reflected-light reflected form the target area upon irradiation  
25 thereof by said illuminating-light, and

displaying the standard-image.

4. A method of displaying a fluorescent-light image  
comprising

irradiating a target area with an illuminating light and  
a excitation light emitted from a excitation light emitting means  
5 and a reference-light emitted from a reference-light emitting means  
and which have been guided to said target area,

obtaining, by use of a single image obtaining means provided  
with separate image obtaining portions for obtaining a  
fluorescent-light image, a standard-image, and a reflected-light  
10 image, respectively, a fluorescent-light image formed of the  
fluorescent-light emitted from the target area upon the irradiation  
thereof by the excitation light, a standard-image formed of the  
reflected-light reflected from the target area upon the irradiation  
thereof by the illuminating light, and a reflected-light image  
15 formed of the reflected-light reflected from the target area upon  
the irradiation thereof by the reference-light, and

displaying a fluorescent-light image based on the obtained  
fluorescent-light image and the obtained reflected-light image  
and a standard-image based on the obtained standard-image, further  
20 comprising

detecting that an operational irregularity has occurred in  
any one of the image obtaining portions, and in response to a  
detection signal thereof,

emitting the illuminating-light,

25 obtaining, by use of an image obtaining portion that is not  
operating irregularly, a standard-image formed of the

reflected-light reflected from the target area upon irradiation thereof by said illuminating-light, and

displaying the standard-image.

5. An apparatus for displaying a fluorescent-light image,

5 comprising

excitation light emitting means for emitting a excitation light,

illuminating-light emitting means for emitting an illuminating-light,

10 light guiding means for guiding the excitation light and the illuminating-light to a target area,

a single image obtaining means provided with separate image obtaining portions for obtaining a fluorescent-light image formed of the fluorescent-light emitted from the target area upon the irradiation thereof by the excitation light and a standard-image formed of the reflected-light reflected from the target area upon the irradiation thereof by the illuminating light, respectively,

15 display means for displaying a fluorescent-light image based on the obtained fluorescent-light image and a standard-image based on the obtained standard-image,

20 an image display controlling means for controlling the excitation light emitting means, the illuminating-light emitting means, the image obtaining means, and the display means, further comprising

25 excitation light irregularity detecting means for detecting that an operational irregularity has occurred in the excitation

light emitting means, and

a standard-image display controlling means for causing, in response to a detection signal from said excitation light irregularity detecting means, the illuminating-light to be emitted from the illuminating-light emitting means, the image obtaining means to switch to a standard-image obtaining mode, and the display means to switch to the standard-image display mode.

6. An apparatus for displaying a fluorescent-light image, comprising

excitation light emitting means for emitting a excitation light,

illuminating-light emitting means for emitting an illuminating-light,

reference-light emitting means for emitting a reference-light,

light guiding means for guiding the excitation light, the illuminating-light, and the reference-light to a target area,

a single image obtaining means provided with separate image obtaining portions for obtaining a fluorescent-light image formed of the fluorescent-light emitted from the target area upon the irradiation thereof by the excitation light, a standard-image formed of the reflected-light reflected from the target area upon the irradiation thereof by the illuminating light, and a reflected-light image formed of the reflected-light reflected from the target area upon the irradiation thereof by the reference-light, respectively,

display means for displaying a fluorescent-light image based on the on the obtained fluorescent-light image and the obtained reflected-light image and a standard-image based on the obtained standard-image,

5 an image display controlling means for controlling the excitation light emitting means, the illuminating-light emitting means, the reference-light emitting means, the image obtaining means, and the display means, further comprising

10 emission output irregularity detecting means for detecting that an operational irregularity has occurred in at least one from among the excitation light emitting means and the reference-light emitting means, and

a standard-image display controlling means for causing, in response to a detection signal from said emission output  
15 irregularity detecting means, the illuminating-light to be emitted from the illuminating-light emitting means, the image obtaining means to switch to a standard-image obtaining mode, and the display means to switch to the standard-image display mode.

7. An apparatus for displaying a fluorescent-light image,  
20 comprising

excitation light emitting means for emitting a excitation light,

illuminating-light emitting means for emitting an illuminating-light,

25 light guiding means for guiding the excitation light and the illuminating-light to a target area,





light,

illuminating-light emitting means for emitting an  
illuminating-light,

reference-light emitting means for emitting a  
5 reference-light,

light guiding means for guiding the excitation light, the  
illuminating-light, and the reference-light to a target area,

a single image obtaining means provided with separate image  
obtaining portions for obtaining a fluorescent-light image formed  
10 of the fluorescent-light emitted from the target area upon the  
irradiation thereof by the excitation light, a standard-image  
formed of the reflected-light reflected from the target area upon  
the irradiation thereof by the illuminating light, and a  
reflected-light image formed of the reflected-light reflected from  
15 the target area upon the irradiation thereof by the reference-light,  
respectively,

display means for displaying a fluorescent-light image based  
on the on the obtained fluorescent-light image and the obtained  
reflected-light image and a standard-image based on the obtained  
20 standard-image,

an image display controlling means for controlling the  
excitation light emitting means, the illuminating-light emitting  
means, the reference-light emitting means, the image obtaining  
means, and the display means, further comprising

25 image-obtainment irregularity detecting means for  
detecting that an operational irregularity has occurred in any

one of the image obtaining portions, and

a standard-image display controlling means for causing, in response to a detection signal from said image-obtainment irregularity detecting means, the illuminating-light to be emitted from the illuminating-light emitting means, the image obtaining means to switch to an image obtaining portion that is not operating irregularly, and the display means to switch to the standard-image display mode.

9. An apparatus for displaying a fluorescent-light image, comprising

excitation light emitting means for emitting a excitation light,

illuminating-light emitting means for emitting an illuminating-light,

light guiding means for guiding the excitation light and the illuminating-light to a target area,

a single image obtaining means provided with separate image obtaining portions for obtaining a fluorescent-light image formed of the fluorescent-light emitted from the target area upon the irradiation thereof by the excitation light and a standard-image formed of the reflected-light reflected from the target area upon the irradiation thereof by the illuminating light, respectively,

display means for displaying a fluorescent-light image based on the on the obtained fluorescent-light image and a standard-image based on the obtained standard-image,

an image display controlling means for controlling the

excitation light emitting means, the illuminating-light emitting means, the image obtaining means, and the display means,

a excitation light emission control line, an illuminating-light emission control line, an image obtainment control line, and a display control line, for electrically connecting the excitation light emitting means, the illuminating light-emitting means, the image obtaining means, and the display means, respectively, to the image display controlling means, wherein

the illuminating-light means emits the illuminating-light in response to the control signal of the illuminating-light emission control line being in the OFF state,

the image obtaining means switches to a standard-image obtaining mode in response to the control signal of the image obtainment control line being in the OFF state,

the display means switches to the standard-image obtaining mode in response to the control signal of the display control line being in the OFF state, further comprising

a disconnection detecting means for detecting that at least one control line from among the illuminating-light emission control line, the image obtainment control line, and the display control line is disconnected, and

a standard-image display controlling means for causing, in response to a detection signal from said disconnection detecting means, the control signal of the control line of from among the illuminating-light emission control line, the image obtainment

emission control line, and the display control line that have not been disconnected to be in the OFF state.

10. An apparatus for displaying a fluorescent-light image, comprising

5       excitation light emitting means for emitting a excitation light,

          illuminating-light emitting means for emitting an illuminating-light,

          reference-light emitting means for emitting a  
10       reference-light,

          light guiding means for guiding the excitation light, the illuminating-light, and the reference-light to a target area,

          a single image obtaining means provided with separate image obtaining portions for obtaining a fluorescent-light image formed  
15       of the fluorescent-light emitted from the target area upon the irradiation thereof by the excitation light, a standard-image formed of the reflected-light reflected from the target area upon the irradiation thereof by the illuminating light, and a  
          reflected-light image formed of the reflected-light reflected from  
20       the target area upon the irradiation thereof by the reference-light, respectively,

          display means for displaying a fluorescent-light image based on the on the obtained fluorescent-light image and the obtained reflected-light image and a standard-image based on the obtained  
25       standard-image,

          an image display controlling means for controlling the

excitation light emitting means, the illuminating-light emitting means, the reference-light emitting means, the image obtaining means, and the display means, further comprising

a excitation light emission control line, an  
5 illuminating-light emission control line, an image obtainment control line, and a display control line, for electrically connecting the excitation light emitting means, the illuminating light-emitting means, the image obtaining means, and the display means, respectively, to the image display controlling means,  
10 wherein

the illuminating-light means emits the illuminating-light in response to the control signal of the illuminating-light emission control line being in the OFF state,

the image obtaining means switches to a standard-image  
15 obtaining mode in response to the control signal of the image obtainment control line being in the OFF state,

the display means switches to the standard-image obtaining mode in response to the control signal of the display control line being in the OFF state, further comprising

20 a disconnection detecting means for detecting that at least one control line from among the illuminating-light emission control line, the image obtainment control line, and the display control line is disconnected, and

a standard-image display controlling means for causing, in  
25 response to a detection signal from said disconnection detecting means, the control signal of the control line of from among the

illuminating-light emission control line, the image obtainment emission control line, and the display control line that have not been short-circuited to be in the OFF state.

11. An apparatus for displaying a fluorescent-light image  
5 as defined in claim 5, 6, 7, 8, 9, or 10, further comprising

input means for causing the illuminating-light to be emitted, the image obtaining means to be switched to the standard-image obtaining mode, and the display means to be switched to the standard-image displaying mode when an operational irregularity  
10 occurs in the image display controlling means.

12. An apparatus for displaying a fluorescent-light image  
as defined in claim 5, 6, 7, 8, 9, or 10, wherein

the display means comprises a single display apparatus that switches between displaying the fluorescent-light image and the  
15 standard-image.

13. An apparatus for displaying a fluorescent-light image  
as defined in claim 11, wherein

the display means is provided with a single display apparatus that switches between displaying the fluorescent-light image and  
20 the standard-image.

14. An apparatus for displaying a fluorescent-light image  
as defined in claim 5, 6, 7, 8, 9, or 10,

the display means is provided with two display apparatuses that display a fluorescent-light image and a standard-image,  
25 respectively.

15. An apparatus for displaying a fluorescent-light image

as defined in claim 11,

the display means is provided with two display apparatuses that display a fluorescent-light image and a standard-image, respectively.

5 16. An apparatus for displaying a fluorescent-light image as defined in claim 7, or 8, wherein

the display apparatus is provided with two display apparatuses that display a fluorescent-light image and a standard-image, respectively, and

10 in response to the detection signal indicating that an operational irregularity has occurred in any of the image obtaining portions, the display apparatus, from among said two display apparatuses, that had been displaying the image obtained by the image obtaining portion for which an operational irregularity has  
15 been detected does not display an image.

17. An apparatus for displaying a fluorescent-light image as defined in claim 7, or 8, wherein

the display apparatus is provided with two display apparatuses that display a fluorescent-light image and a  
20 standard-image, respectively, and

in response to the detection signal indicating that an operational irregularity has occurred in any of the image obtaining portions, the display apparatus, from among said two display apparatuses, that had been displaying the image obtained by the  
25 image obtaining portion for which an operational irregularity has been detected displays a freeze-frame image.

18. An apparatus for displaying a fluorescent-light image  
as defined in claim 7, or 8, wherein

the display apparatus is provided with two display  
apparatuses that display a fluorescent-light image and a  
5 standard-image, respectively, and

in response to the detection signal indicating that an  
operational irregularity has occurred in any of the image obtaining  
portions, the display apparatus, from among said two display  
apparatuses, that had been displaying the image obtained by the  
10 image obtaining portion for which an operational irregularity has  
been detected displays a message indicating that an operation  
irregularity has occurred in an image obtaining portion.

19. An apparatus for displaying a fluorescent-light image  
as defined in claim 5, 6, 7, 8, 9, or 10, wherein the excitation  
15 light source is a GaN semiconductor laser.